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1600

## RAW SEQUENCE LISTING

DATE: 01/03/2003

PATENT APPLICATION: US/08/737,904H

TIME: 09:17:49

Input Set : N:\Crf4\01022003\H737904G.raw

Output Set: N:\CRF4\01032003\H737904H.raw

1 <110> APPLICANT: Griffith, Irwin J.  
 2 Kuo, Mei-Chang  
 3 Luqman, Mohammad  
 4 <120> TITLE OF INVENTION: T CELL EPITOPES OF RYEGRASS POLLEN ALLERGEN  
 5 <130> FILE REFERENCE: IMI-040CP3  
 C--> 6 <140> CURRENT APPLICATION NUMBER: US/08/737,904H  
 7 <141> CURRENT FILING DATE: 1996-11-20  
 8 <150> PRIOR APPLICATION NUMBER: 08/106,016  
 9 <151> PRIOR FILING DATE: 1993-08-13  
 10 <160> NUMBER OF SEQ ID NOS: 62  
 11 <170> SOFTWARE: PatentIn Ver. 2.0  
 13 <210> SEQ ID NO: 1  
 14 <211> LENGTH: 1229  
 15 <212> TYPE: DNA  
 16 <213> ORGANISM: Lolium perenne  
 17 <220> FEATURE:  
 18 <221> NAME/KEY: CDS  
 19 <222> LOCATION: (40)...(942)  
 20 <220> FEATURE:  
 21 <221> NAME/KEY: sig\_peptide  
 22 <222> LOCATION: (40)...(115)  
 23 <220> FEATURE:  
 24 <221> NAME/KEY: mat\_peptide  
 25 <222> LOCATION: (115)...(942)  
 26 <400> SEQUENCE: 1  
 27 cgctatccct ccctcgtaca aacaaacgca agagcagca atg gcc gtc cag aag 54  
 28 Met Ala Val Gln Lys  
 29 -25  
 30 tac acg gtg gct cta ttc ctc gcc gtg gcc ctc gtg gcg ggc ccg gcc 102  
 31 Tyr Thr Val Ala Leu Phe Leu Ala Val Ala Leu Val Ala Gly Pro Ala  
 32 -20 -15 -10 -5  
 33 gcc tcc tac gcc gct gac gcc ggc tac acc ccc gca gcc gcg gcc acc 150  
 34 Ala Ser Tyr Ala Ala Asp Ala Gly Tyr Thr Pro Ala Ala Ala Ala Thr  
 35 1 5 10  
 36 ccg gct act cct gct gcc acc ccg gct gcg gct gga ggg aag gcg acg 198  
 37 Pro Ala Thr Pro Ala Ala Thr Pro Ala Ala Ala Gly Gly Lys Ala Thr  
 38 15 20 25  
 39 acc gac gag cag aag ctg ctg gag gac gtc aac gct ggc ttc aag gca 246  
 40 Thr Asp Glu Gln Lys Leu Leu Glu Asp Val Asn Ala Gly Phe Lys Ala  
 41 30 35 40  
 42 gcc gtg gcc gcc gct gcc aac gcc cct ccg gcg gac aag ttc aag atc 294  
 43 Ala Val Ala Ala Ala Ala Asn Ala Pro Pro Ala Asp Lys Phe Lys Ile  
 44 45 50 55 60

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```

45      ttc gag gcc gcc ttc tcc gag tcc tcc aag ggc ctc ctc gcc acc tcc      342
46      Phe Glu Ala Ala Phe Ser Glu Ser Ser Lys Gly Leu Leu Ala Thr Ser
47              65              70              75
48      gcc gcc aag gca ccc ggc ctc atc ccc aag ctc gac acc gcc tac gac      390
49      Ala Ala Lys Ala Pro Gly Leu Ile Pro Lys Leu Asp Thr Ala Tyr Asp
50              80              85              90
51      gtc gcc tac aag gcc gcc gag ggc gcc acc ccc gag gcc aag tac gac      438
52      Val Ala Tyr Lys Ala Ala Glu Gly Ala Thr Pro Glu Ala Lys Tyr Asp
53              95              100              105
54      gcc ttc gtc act gcc ctc acc gaa gcg ctc cgc gtc atc gcc ggc gcc      486
55      Ala Phe Val Thr Ala Leu Thr Glu Ala Leu Arg Val Ile Ala Gly Ala
56              110              115              120
57      ctc gag gtc cac gcc gtc aag ccc gcc acc gag gag gtc cct gct gct      534
58      Leu Glu Val His Ala Val Lys Pro Ala Thr Glu Glu Val Pro Ala Ala
59      125              130              135              140
60      aag atc ccc acc ggt gag ctg cag atc gtt gac aag atc gat gct gcc      582
61      Lys Ile Pro Thr Gly Glu Leu Gln Ile Val Asp Lys Ile Asp Ala Ala
62              145              150              155
63      ttc aag atc gca gcc acc gcc gcc aac gcc gcc ccc acc aac gat aag      630
64      Phe Lys Ile Ala Ala Thr Ala Ala Asn Ala Ala Pro Thr Asn Asp Lys
65              160              165              170
66      ttc acc gtc ttc gag agt gcc ttc aac aag gcc ctc aat gag tgc acg      678
67      Phe Thr Val Phe Glu Ser Ala Phe Asn Lys Ala Leu Asn Glu Cys Thr
68              175              180              185
69      ggc ggc gcc tat gag acc tac aag ttc atc ccc tcc ctc gag gcc gcg      726
70      Gly Gly Ala Tyr Glu Thr Tyr Lys Phe Ile Pro Ser Leu Glu Ala Ala
71      190              195              200
72      gtc aag cag gcc tac gcc gcc acc gtc gcc gcc gcg ccc gag gtc aag      774
73      Val Lys Gln Ala Tyr Ala Ala Thr Val Ala Ala Ala Pro Glu Val Lys
74      205              210              215              220
75      tac gcc gtc ttt gag gcc gcg ctg acc aag gcc atc acc gcc atg acc      822
76      Tyr Ala Val Phe Glu Ala Ala Leu Thr Lys Ala Ile Thr Ala Met Thr
77              225              230              235
78      cag gca cag aag gcc ggc aaa ccc gct gcc gcc gct gcc aca ggc gcc      870
79      Gln Ala Gln Lys Ala Gly Lys Pro Ala Ala Ala Ala Ala Thr Gly Ala
80              240              245              250
81      gca acc gtt gcc acc ggc gcc gca acc gcc gcc gcc ggt gct gcc acc      918
82      Ala Thr Val Ala Thr Gly Ala Ala Thr Ala Ala Ala Gly Ala Ala Thr
83              255              260              265
84      gcc gct gct ggt ggc tac aaa gcc tgatcagctt gctaatatac tactgaacgt      972
85      Ala Ala Ala Gly Gly Tyr Lys Ala
86              270              275
87      atgtatgtgc atgatccggg cggcgagtgg ttttgttgat aattaatctt cgttttcggt 1032
88      tcatgcagcc gcgatcgaga gggcttgcat gcttgtaata attcaatatt ttccatttct 1092
89      ttttgaatct gtaaatcccc atgacaagta gtgggatcaa gtcggcatgt atcaccgttg 1152
90      atgcgagttt aacgatgggg agttttatcaa agaattttatt attaaaaaaa aaaaaaaaaa 1212
91      aaaaaaaaaa aaaaaaa
92              1229
93 <210> SEQ ID NO: 2
94 <211> LENGTH: 301

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Input Set : N:\Cr4\01022003\H737904G.raw

Output Set: N:\CRF4\01032003\H737904H.raw

```

95 <212> TYPE: PRT
96 <213> ORGANISM: Lolium perenne
97 <220> FEATURE:
98 <221> NAME/KEY: SIGNAL
99 <222> LOCATION: (1)...(25)
100 <400> SEQUENCE: 2
101   Met Ala Val Gln Lys Tyr Thr Val Ala Leu Phe Leu Ala Val Ala Leu
102   -25                               -20                               -15                               -10
103   Val Ala Gly Pro Ala Ala Ser Tyr Ala Ala Asp Ala Gly Tyr Thr Pro
104                               -5                               1                               5
105   Ala Ala Ala Ala Thr Pro Ala Thr Pro Ala Ala Thr Pro Ala Ala Ala
106   10                               15                               20
107   Gly Gly Lys Ala Thr Thr Asp Glu Gln Lys Leu Leu Glu Asp Val Asn
108   25                               30                               35
109   Ala Gly Phe Lys Ala Ala Val Ala Ala Ala Ala Asn Ala Pro Pro Ala
110   40                               45                               50                               55
111   Asp Lys Phe Lys Ile Phe Glu Ala Ala Phe Ser Glu Ser Ser Lys Gly
112                               60                               65                               70
113   Leu Leu Ala Thr Ser Ala Ala Lys Ala Pro Gly Leu Ile Pro Lys Leu
114   75                               80                               85
115   Asp Thr Ala Tyr Asp Val Ala Tyr Lys Ala Ala Glu Gly Ala Thr Pro
116   90                               95                               100
117   Glu Ala Lys Tyr Asp Ala Phe Val Thr Ala Leu Thr Glu Ala Leu Arg
118   105                              110                              115
119   Val Ile Ala Gly Ala Leu Glu Val His Ala Val Lys Pro Ala Thr Glu
120   120                              125                              130                              135
121   Glu Val Pro Ala Ala Lys Ile Pro Thr Gly Glu Leu Gln Ile Val Asp
122   140                              145                              150
123   Lys Ile Asp Ala Ala Phe Lys Ile Ala Ala Thr Ala Ala Asn Ala Ala
124   155                              160                              165
125   Pro Thr Asn Asp Lys Phe Thr Val Phe Glu Ser Ala Phe Asn Lys Ala
126   170                              175                              180
127   Leu Asn Glu Cys Thr Gly Gly Ala Tyr Glu Thr Tyr Lys Phe Ile Pro
128   185                              190                              195
129   Ser Leu Glu Ala Ala Val Lys Gln Ala Tyr Ala Ala Thr Val Ala Ala
130   200                              205                              210                              215
131   Ala Pro Glu Val Lys Tyr Ala Val Phe Glu Ala Ala Leu Thr Lys Ala
132   220                              225                              230
133   Ile Thr Ala Met Thr Gln Ala Gln Lys Ala Gly Lys Pro Ala Ala Ala
134   235                              240                              245
135   Ala Ala Thr Gly Ala Ala Thr Val Ala Thr Gly Ala Ala Thr Ala Ala
136   250                              255                              260
137   Ala Gly Ala Ala Thr Ala Ala Ala Gly Gly Tyr Lys Ala
138   265                              270                              275
140 <210> SEQ ID NO: 3
141 <211> LENGTH: 20
142 <212> TYPE: PRT
143 <213> ORGANISM: Lolium perenne
144 <220> FEATURE:

```

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DATE: 01/03/2003

PATENT APPLICATION: US/08/737,904H

TIME: 09:17:49

Input Set : N:\Crf4\01022003\H737904G.raw

Output Set: N:\CRF4\01032003\H737904H.raw

```

145 <221> NAME/KEY: VARIANT
146 <222> LOCATION: (7)
147 <223> OTHER INFORMATION: Xaa = hydroxyproline residue
148 <220> FEATURE:
149 <221> NAME/KEY: VARIANT
150 <222> LOCATION: (13)
151 <223> OTHER INFORMATION: Xaa = hydroxyproline residue
152 <220> FEATURE:
153 <221> NAME/KEY: VARIANT
154 <222> LOCATION: (16)
155 <223> OTHER INFORMATION: Xaa = hydroxyproline residue
156 <220> FEATURE:
157 <221> NAME/KEY: VARIANT
158 <222> LOCATION: (20)
159 <223> OTHER INFORMATION: Xaa = hydroxyproline residue
160 <400> SEQUENCE: 3
W--> 161      Ala Asp Ala Gly Tyr Thr Xaa Ala Ala Ala Thr Xaa Ala Thr Xaa
      1              5              10              15
W--> 163      Ala Ala Thr Xaa
      164              20
166 <210> SEQ ID NO: 4
167 <211> LENGTH: 20
168 <212> TYPE: PRT
169 <213> ORGANISM: Lolium perenne
170 <220> FEATURE:
171 <221> NAME/KEY: VARIANT
172 <222> LOCATION: (3)
173 <223> OTHER INFORMATION: Xaa = hydroxyproline residue
174 <220> FEATURE:
175 <221> NAME/KEY: VARIANT
176 <222> LOCATION: (6)
177 <223> OTHER INFORMATION: Xaa = hydroxyproline residue
178 <220> FEATURE:
179 <221> NAME/KEY: VARIANT
180 <222> LOCATION: (10)
181 <223> OTHER INFORMATION: Xaa = hydroxyproline residue
182 <400> SEQUENCE: 4
W--> 183      Ala Thr Xaa Ala Thr Xaa Ala Ala Thr Xaa Ala Ala Ala Gly Gly Lys
      1              5              10              15
185      Ala Thr Thr Asp
186              20
188 <210> SEQ ID NO: 5
189 <211> LENGTH: 20
190 <212> TYPE: PRT
191 <213> ORGANISM: Lolium perenne
192 <220> FEATURE:
193 <400> SEQUENCE: 5
194      Ala Ala Ala Gly Gly Lys Ala Thr Thr Asp Glu Gln Lys Leu Leu Glu
195      1              5              10              15

```

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PATENT APPLICATION: US/08/737,904H

TIME: 09:17:49

Input Set : N:\CrF4\01022003\H737904G.raw

Output Set: N:\CRF4\01032003\H737904H.raw

```

196      Asp Val Asn Ala
197                      20
199 <210> SEQ ID NO: 6
200 <211> LENGTH: 20
201 <212> TYPE: PRT
202 <213> ORGANISM: Lolium perenne
203 <400> SEQUENCE: 6
204      Glu Gln Lys Leu Leu Glu Asp Val Asn Ala Gly Phe Lys Ala Ala Val
205          1                      5                      10                      15
206      Ala Ala Ala Ala
207                      20
209 <210> SEQ ID NO: 7
210 <211> LENGTH: 20
211 <212> TYPE: PRT
212 <213> ORGANISM: Lolium perenne
213 <400> SEQUENCE: 7
214      Gly Phe Lys Ala Ala Val Ala Ala Ala Ala Asn Ala Pro Pro Ala Asp
215          1                      5                      10                      15
216      Lys Phe Lys Ile
217                      20
219 <210> SEQ ID NO: 8
220 <211> LENGTH: 20
221 <212> TYPE: PRT
222 <213> ORGANISM: Lolium perenne
223 <400> SEQUENCE: 8
224      Asn Ala Pro Pro Ala Asp Lys Phe Lys Ile Phe Glu Ala Ala Phe Ser
225          1                      5                      10                      15
226      Glu Ser Ser Lys
227                      20
229 <210> SEQ ID NO: 9
230 <211> LENGTH: 20
231 <212> TYPE: PRT
232 <213> ORGANISM: Lolium perenne
233 <400> SEQUENCE: 9
234      Phe Glu Ala Ala Phe Ser Glu Ser Ser Lys Gly Leu Leu Ala Thr Ser
235          1                      5                      10                      15
236      Ala Ala Lys Ala
237                      20
239 <210> SEQ ID NO: 10
240 <211> LENGTH: 20
241 <212> TYPE: PRT
242 <213> ORGANISM: Lolium perenne
243 <400> SEQUENCE: 10
244      Gly Leu Leu Ala Thr Ser Ala Ala Lys Ala Pro Gly Leu Ile Pro Lys
245          1                      5                      10                      15
246      Leu Asp Thr Ala
247                      20
249 <210> SEQ ID NO: 11
250 <211> LENGTH: 20

```

RAW SEQUENCE LISTING ERROR SUMMARY  
PATENT APPLICATION: US/08/737,904H

DATE: 01/03/2003  
TIME: 09:17:50

Input Set : N:\Crf4\01022003\H737904G.raw  
Output Set: N:\CRF4\01032003\H737904H.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:3; Xaa Pos. 7,13,16,20  
Seq#:4; Xaa Pos. 3,6,10  
Seq#:31; Xaa Pos. 5,8  
Seq#:54; Xaa Pos. 7,13,16,20

**VERIFICATION SUMMARY**

PATENT APPLICATION: **US/08/737,904H**

DATE: 01/03/2003

TIME: 09:17:50

Input Set : **N:\Crf4\01022003\H737904G.raw**

Output Set: **N:\CRF4\01032003\H737904H.raw**

L:6 M:270 C: Current Application Number differs, Wrong Format  
L:161 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 after pos.:0  
L:163 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 after pos.:16  
L:183 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4 after pos.:0  
L:460 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:31 after pos.:0  
L:706 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:54 after pos.:0  
L:708 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:54 after pos.:16